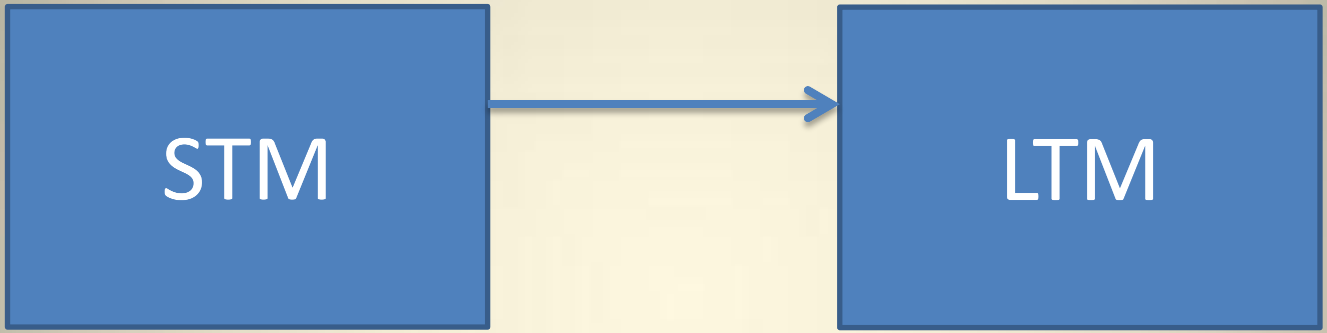
Encoding into long-term memory

Psychology 248

Prof. Benjamin

How to move information into LTM



STM

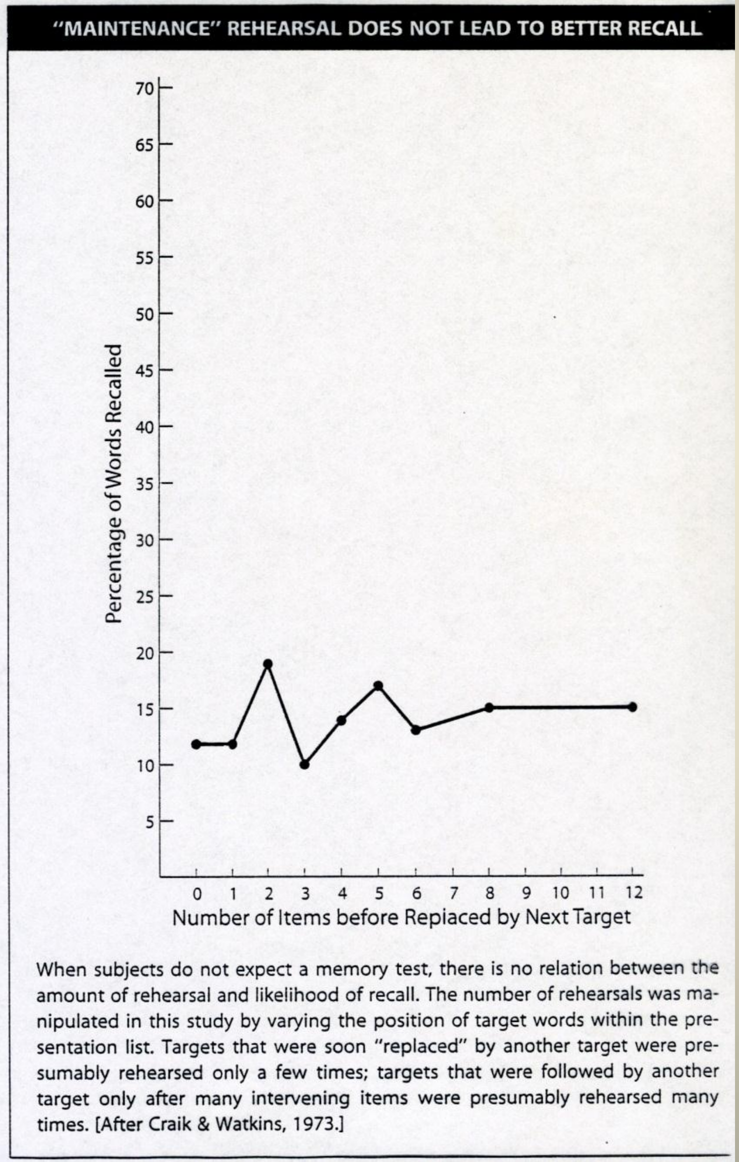
LTM

rote rehearsal?

Effects of rote rehearsal on LTM

- While I read you this list, always remember THE LAST B WORD YOU HEARD.

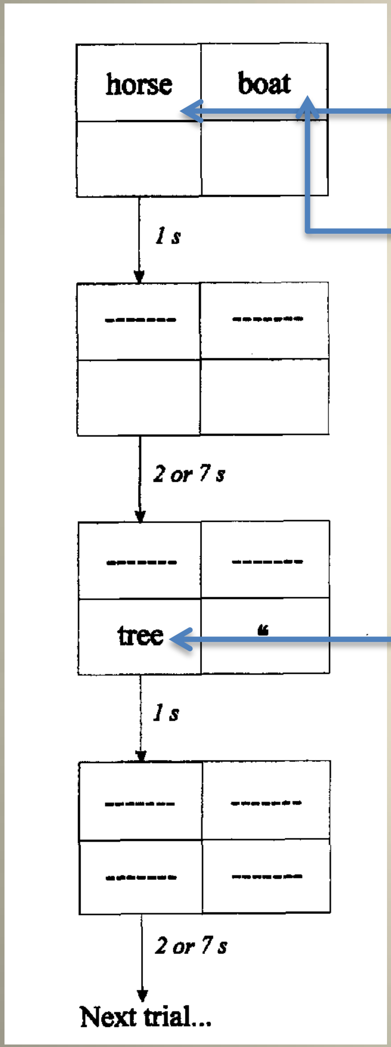
Effects of rote rehearsal on LTM



"MAINTENANCE" REHEARSAL DOES NOT LEAD TO BETTER RECALL

When subjects do not expect a memory test, there is no relation between the amount of rehearsal and likelihood of recall. The number of rehearsals was manipulated in this study by varying the position of target words within the presentation list. Targets that were soon "replaced" by another target were presumably rehearsed only a few times; targets that were followed by another target only after many intervening items were presumably rehearsed many times. [After Craik & Watkins, 1973.]

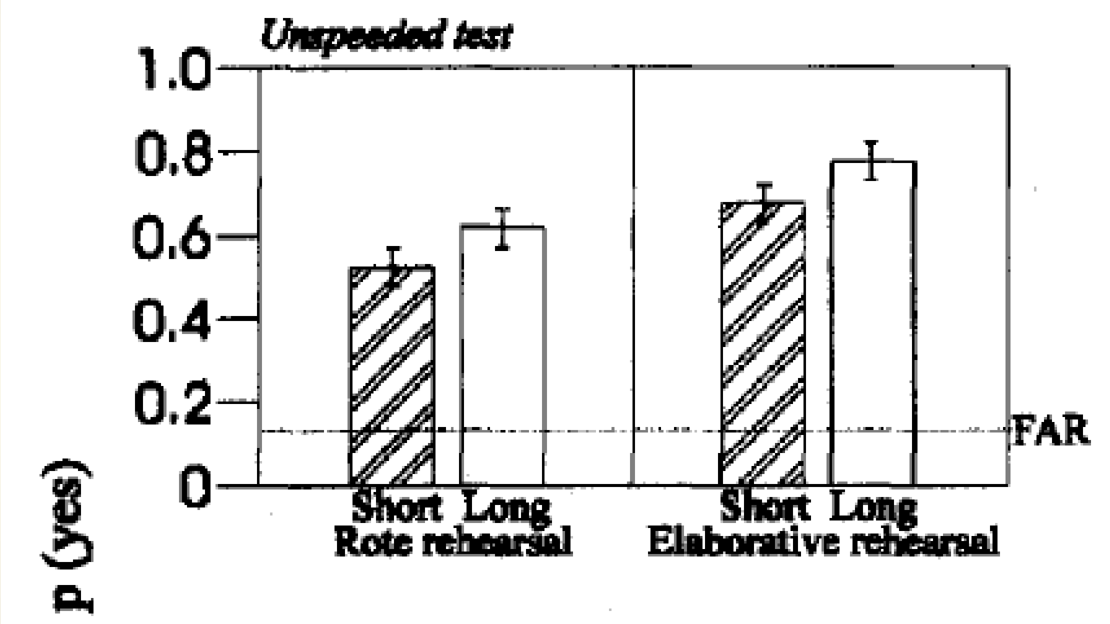
Rote vs. elaborative rehearsal



all *rote* rehearsal

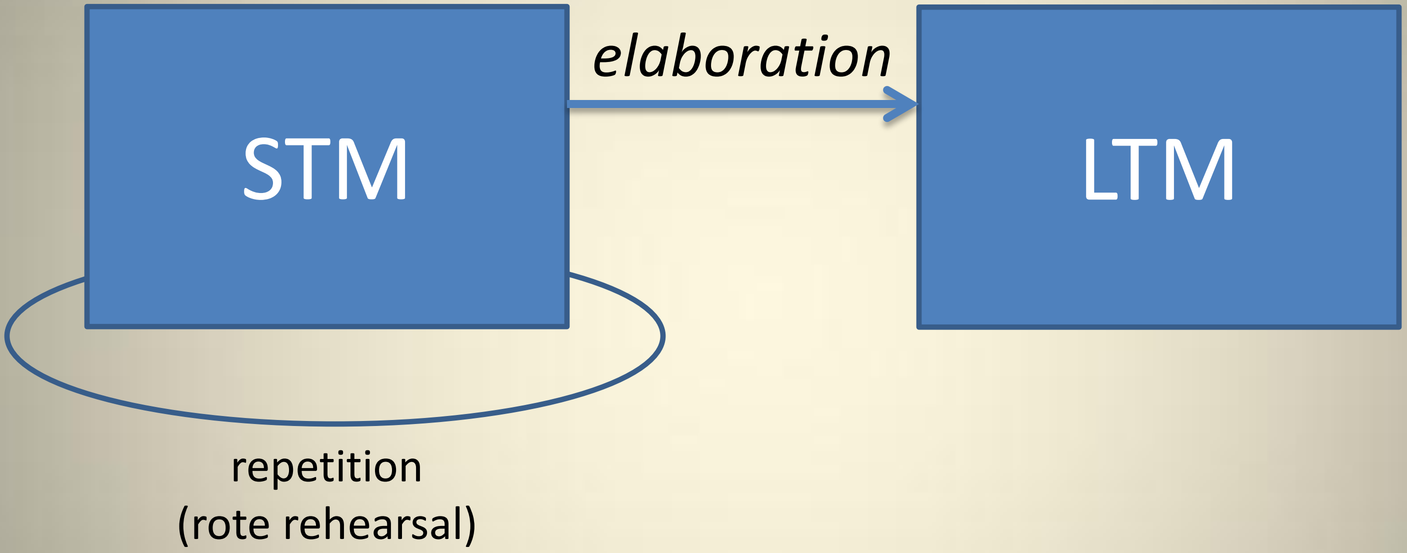
mixed

all *elaborative* rehearsal



Benjamin & Bjork (2000)

How to move information into LTM



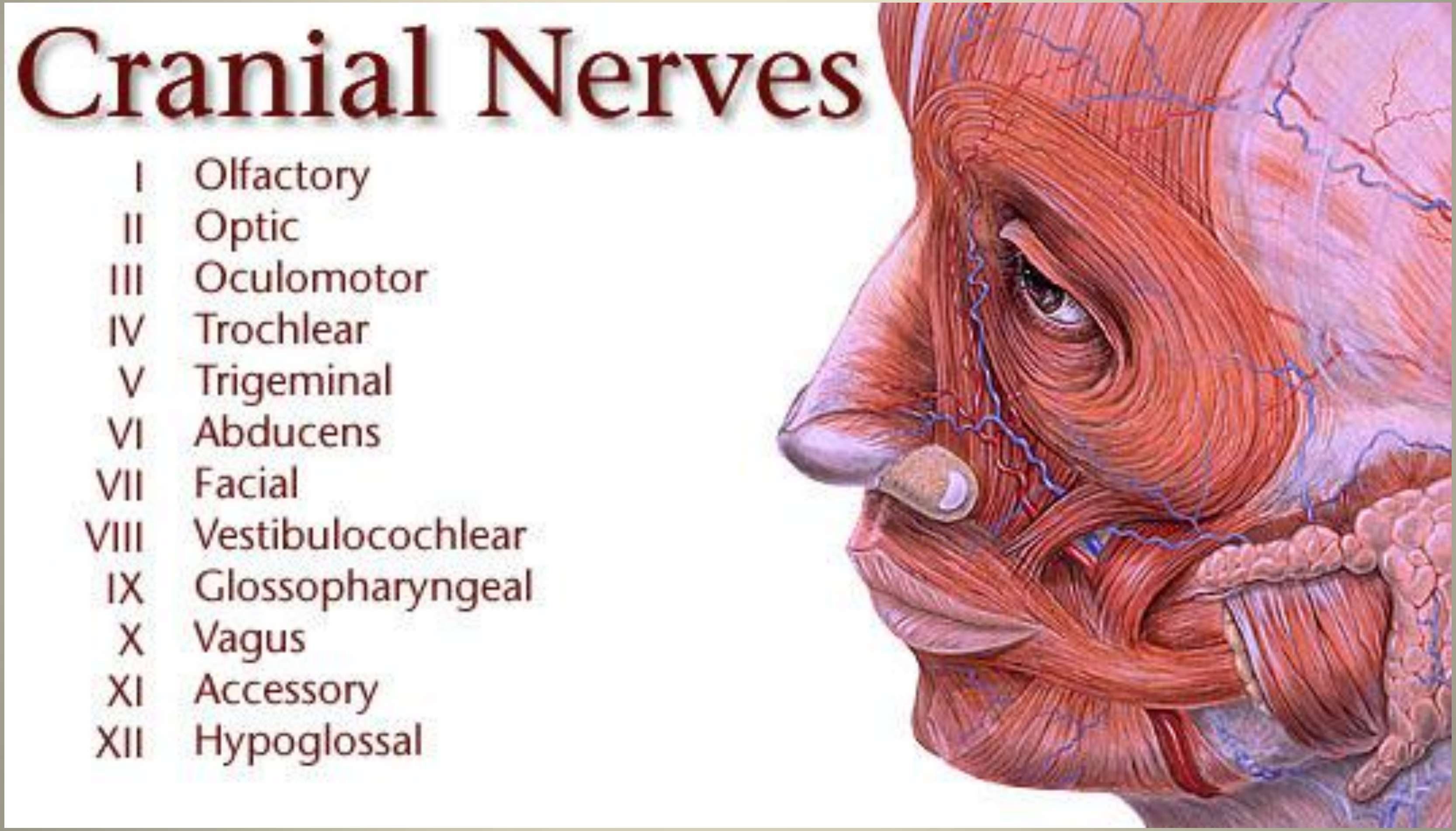
STM

elaboration

LTM

repetition
(rote rehearsal)

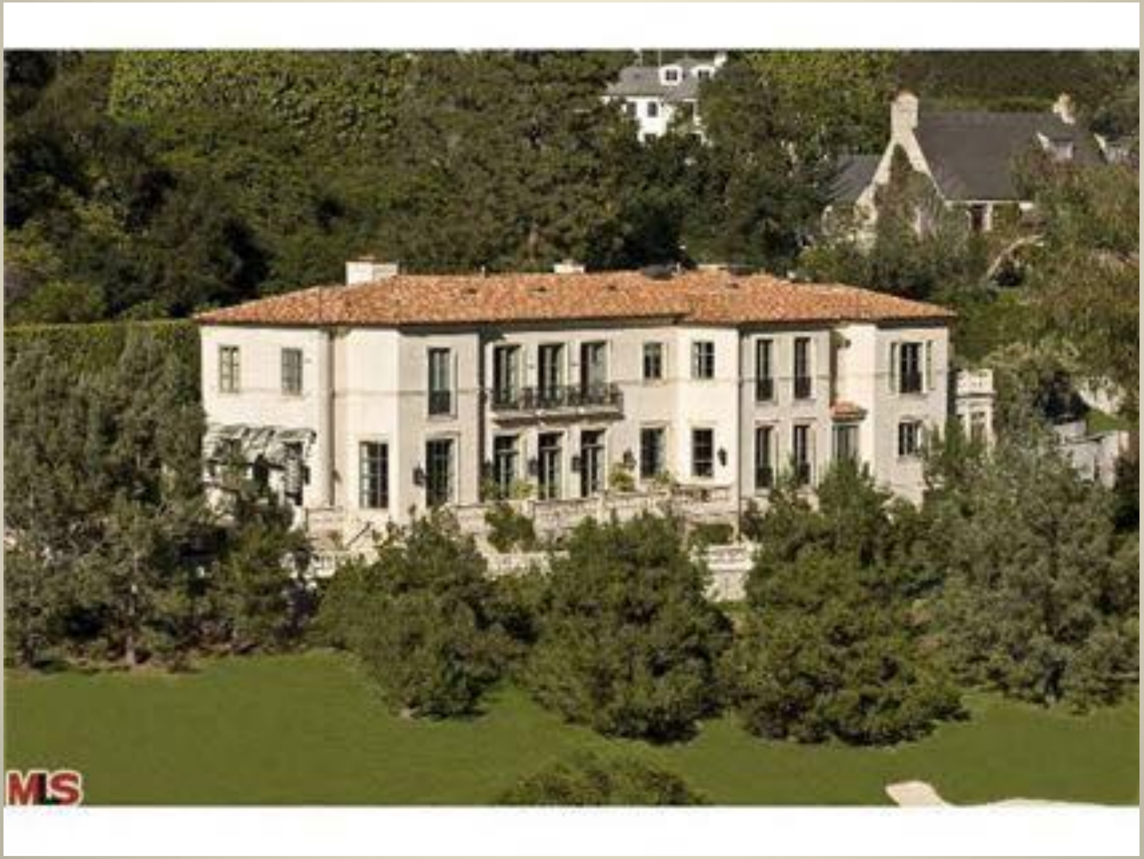
Mnemonics



Cranial Nerves

I	Olfactory
II	Optic
III	Oculomotor
IV	Trochlear
V	Trigeminal
VI	Abducens
VII	Facial
VIII	Vestibulocochlear
IX	Glossopharyngeal
X	Vagus
XI	Accessory
XII	Hypoglossal

Method of loci



Use a familiar location (my summer home)

Acronym mnemonics

Mnemonic: **S**ome **S**ay **M**ore **M**oney **B**ut **M**y **B**rother **S**ays **B**ig **B**ooks **M**atter **M**ore

S = sensory nerves

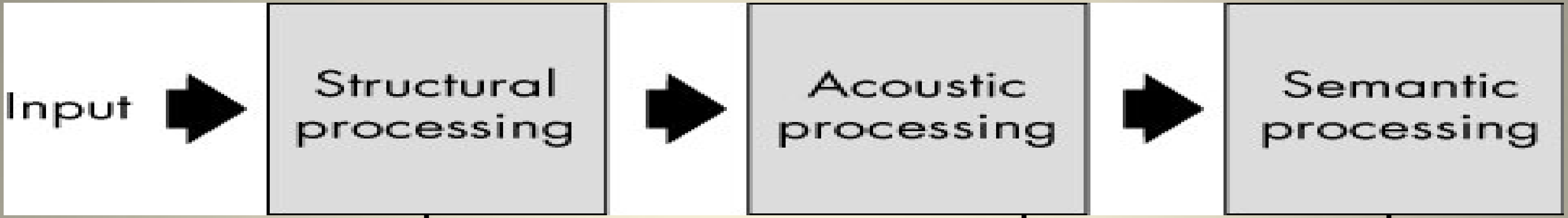
M = motor nerves

B = both/mixed

- Olfactory: Some: Sensory
- Optic: Say: Sensory
- Oculomotor: More: Motor
- Trochlear: Money: Motor
- Trigeminal: But: Mixed
- Abducens: My: Motor
- Facial: Brother: Mixed
- Vestibulocochlear: Says: Sensory
- Glossopharyngeal: Big: Mixed
- Vagus: Books: Mixed
- Spinal Accessory: Matter: Motor
- Hypoglossal: More: Motor

Costs and benefits of mnemonics?

Levels of processing

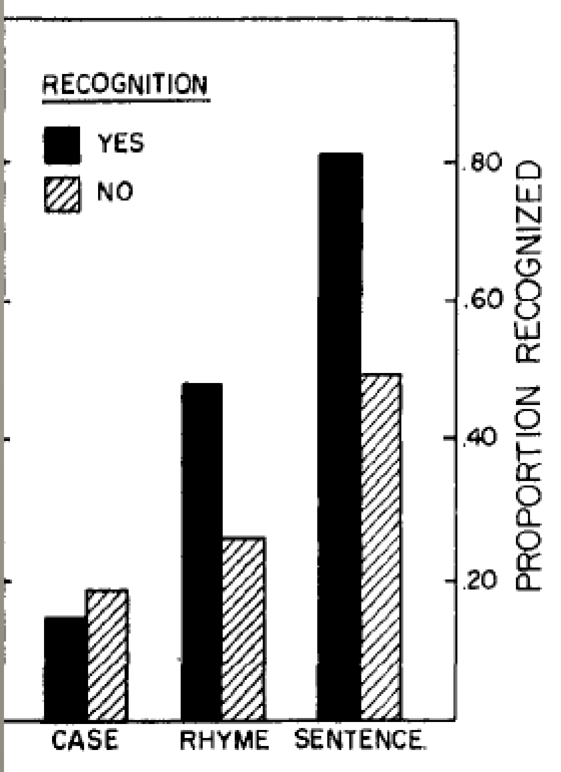


Is it in uppercase?

clock

Could you use it in the sentence: “Look at the ____ and see what time it is?”

Does it rhyme with sock?



Craik & Tulving (1975)

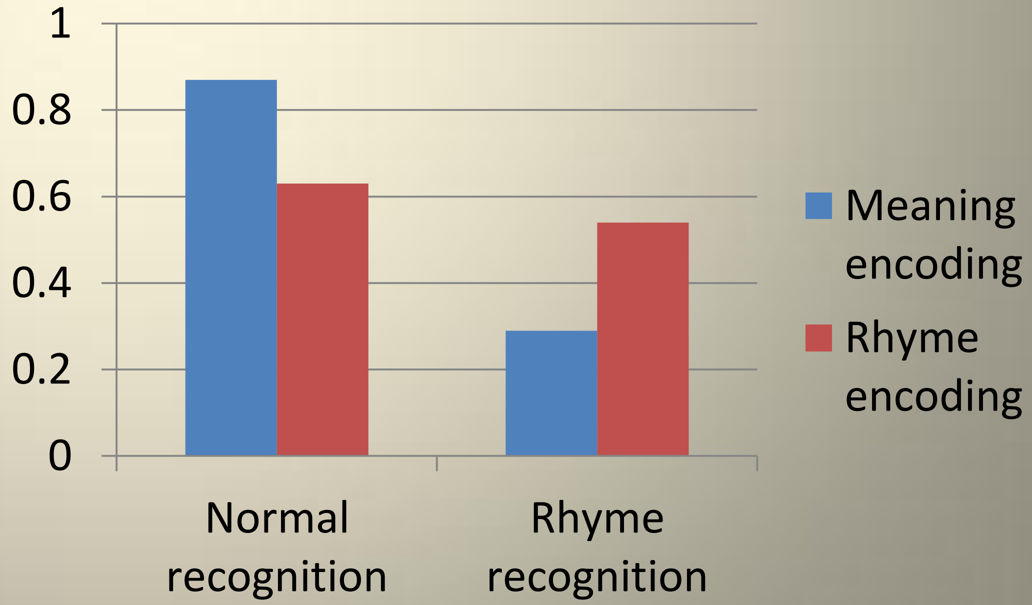
Transfer-appropriate processing

- *Meaning*: Does the word fit the sentence?

  The _____ was on the shelf. [Book]

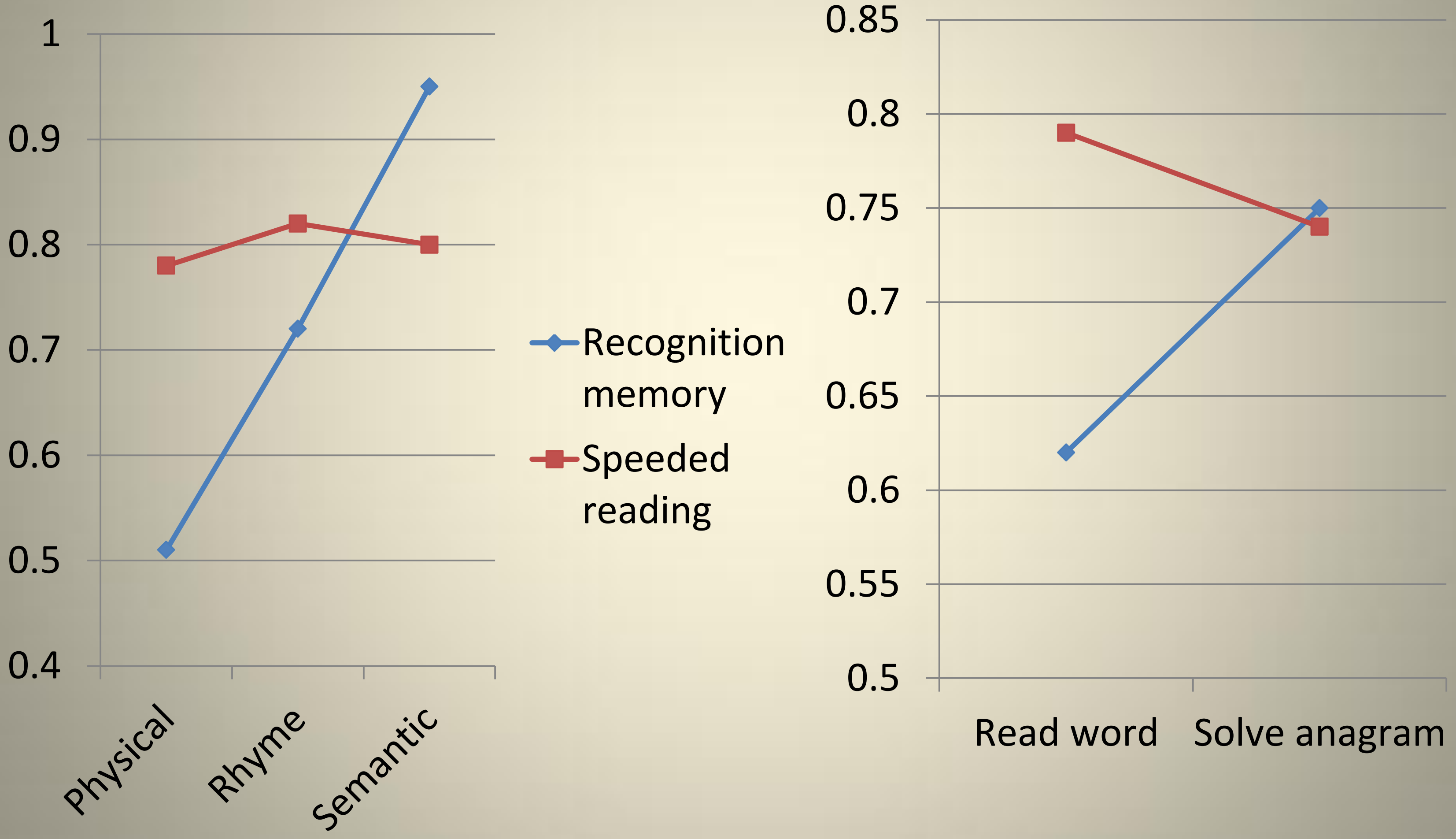
- *Rhyme*: Does the word rhyme?

  _____ rhymes with fear. [Beer]



Morris, Bransford, & Franks (1977)

Transfer-appropriate processing



Jacoby & Dallas (1981)

Time of day and memory

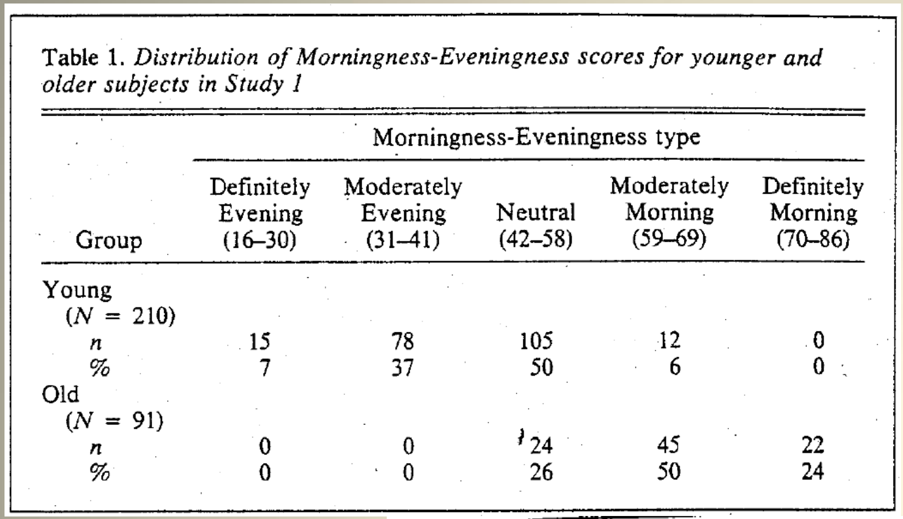


Table 1. *Distribution of Morningness-Eveningness scores for younger and older subjects in Study 1*

Group	Definitely Evening (16–30)	Moderately Evening (31–41)	Neutral (42–58)	Moderately Morning (59–69)	Definitely Morning (70–86)
	Morningness-Eveningness type				
Young (*N* = 210)					
n	15	78	105	12	0
%	7	37	50	6	0
Old (*N* = 91)					
n	0	0	24	45	22
%	0	0	26	50	24

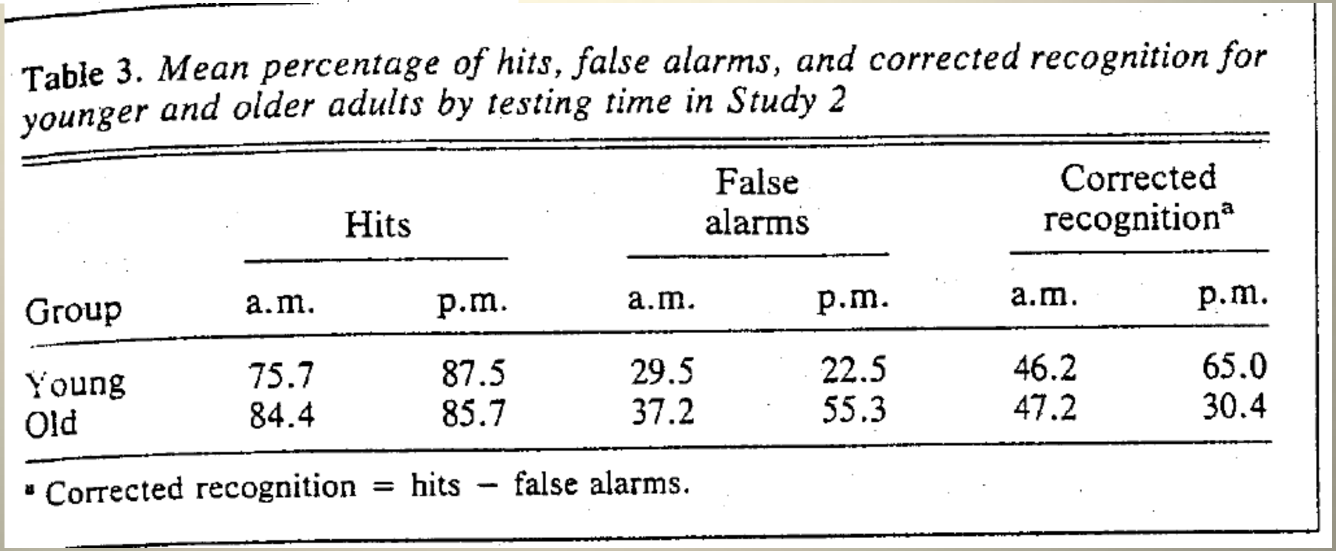


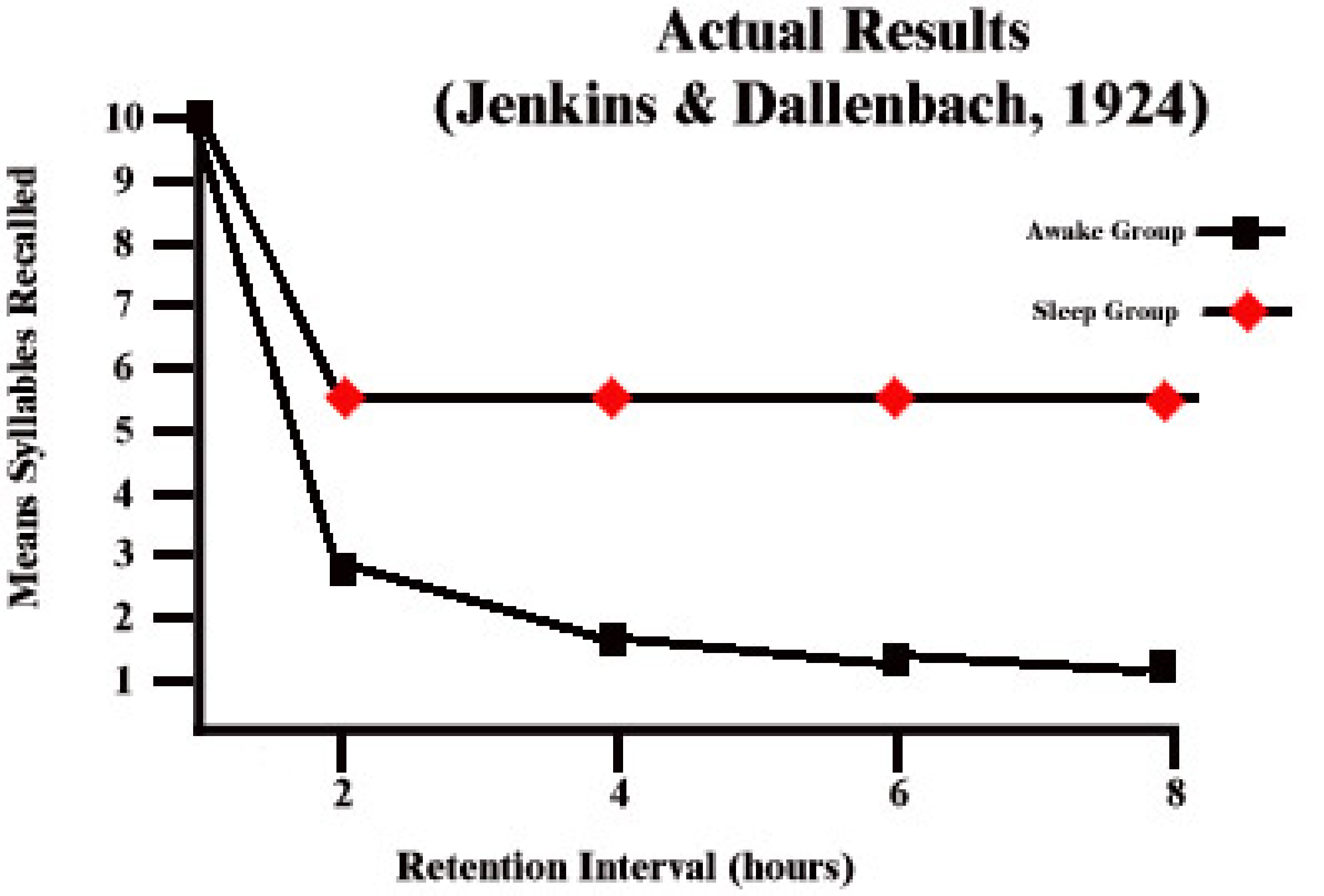
Table 3. *Mean percentage of hits, false alarms, and corrected recognition for younger and older adults by testing time in Study 2*

	Hits		False alarms		Corrected recognition[a]	
Group	a.m.	p.m.	a.m.	p.m.	a.m.	p.m.
Young	75.7	87.5	29.5	22.5	46.2	65.0
Old	84.4	85.7	37.2	55.3	47.2	30.4

[a] Corrected recognition = hits − false alarms.

May, Hasher, & Stolzfus (1993)

Sleep and learning



Imagery and memory

Study:

House

Frog

or

Tree

Camera

Dual code hypothesis of Paivio (1969)

Survival processing

Survival processing scenario

In this task we would like you to imagine that you are stranded in the grasslands of a foreign land, without any basic survival materials. Over the next few months, you’ll need to find steady supplies of food and water and protect yourself from predators. We are going to show you a list of words, and we would like you to rate how relevant each of these words would be for you in this survival situation. Some of the words may be relevant and others may not—it’s up to you to decide.

Moving scenario

In this task we would like you to imagine that you are planning to move to a new home in a foreign land. Over the next few months, you’ll need to locate and purchase a new home and transport your belongings. We are going to show you a list of words, and we would like you to rate how relevant each of these words would be for you in accomplishing this task. Some of the words may be relevant and others may not—it’s up to you to decide.

Nairne & Pandeirada (2008)

Survival processing

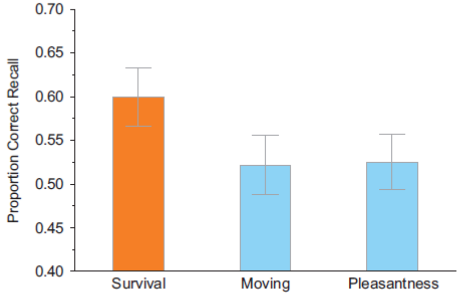


Fig. 1. Average proportion correct on a surprise free-recall test for three groups of participants. The three groups previously rated random words for their pleasantness or for their relevance to a survival scenario or a moving scenario. Data from Experiment 1 in Nairne, Thompson, and Pandeirada (2007). Error bars indicate 95% confidence intervals.

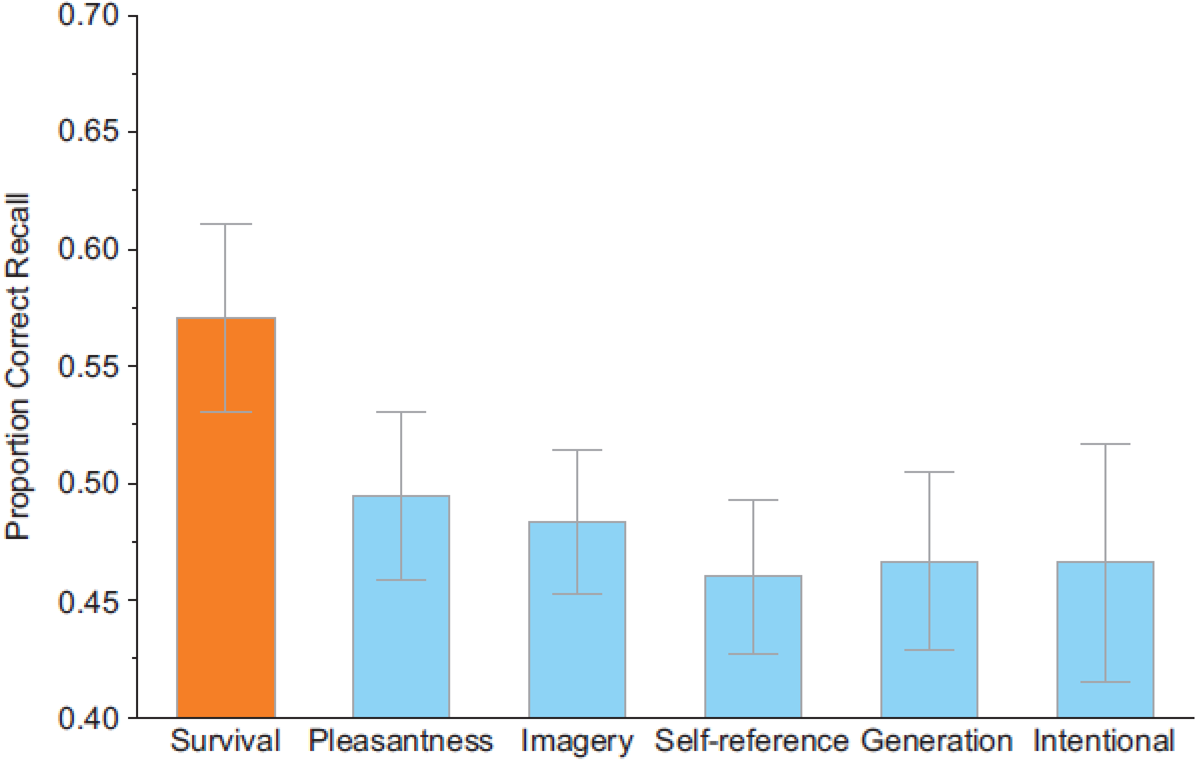
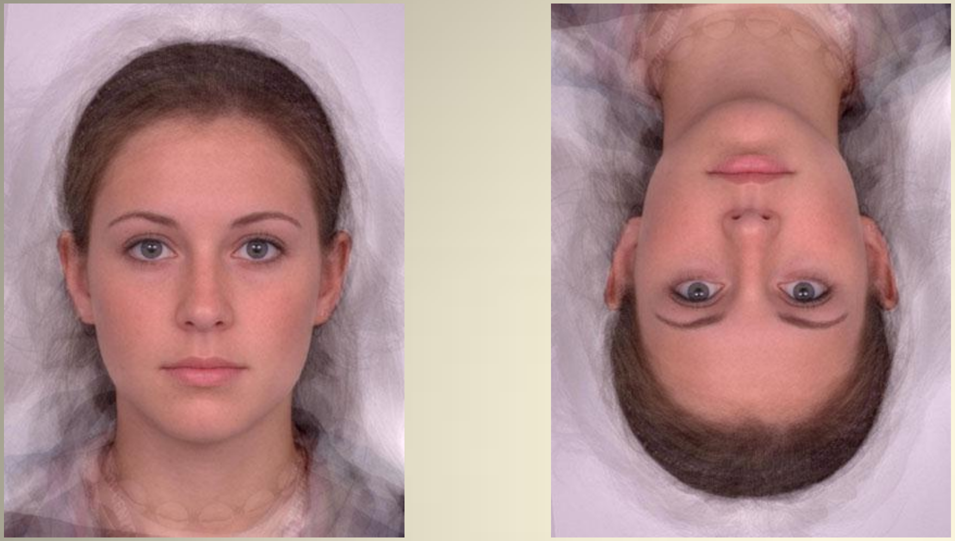


Fig. 2. Average proportion correct free recall for each condition. Separate groups of participants were asked to rate unrelated words for their relevance to a survival scenario, their pleasantness, the ease of generating a visual image of them, or the ease of generating an autobiographical memory of them, or they were asked to generate a word from scrambled letters. An intentional learning condition, in which participants were asked to remember the words for a later test, was also included. Data from Experiment 1 in Nairne, Pandeirada, and Thompson (2008). Error bars indicate 95% confidence intervals.

Memory for faces



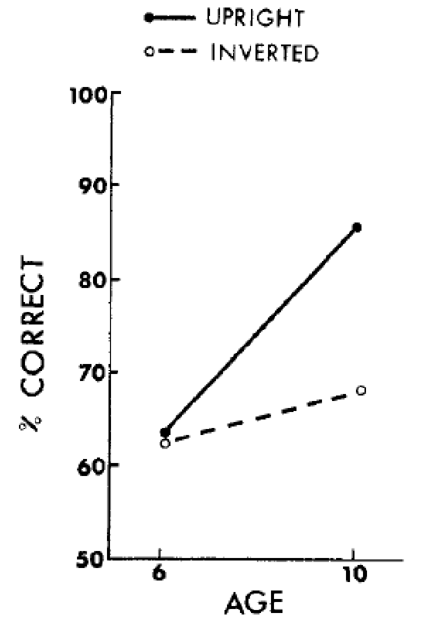
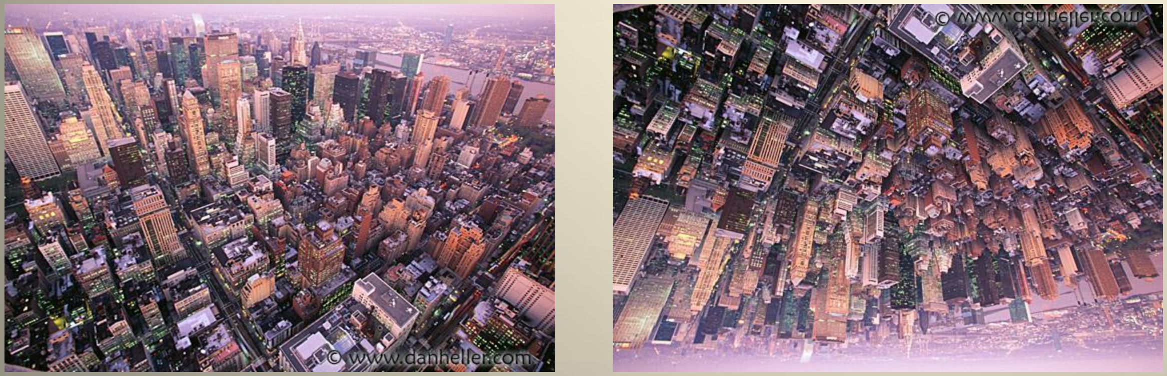
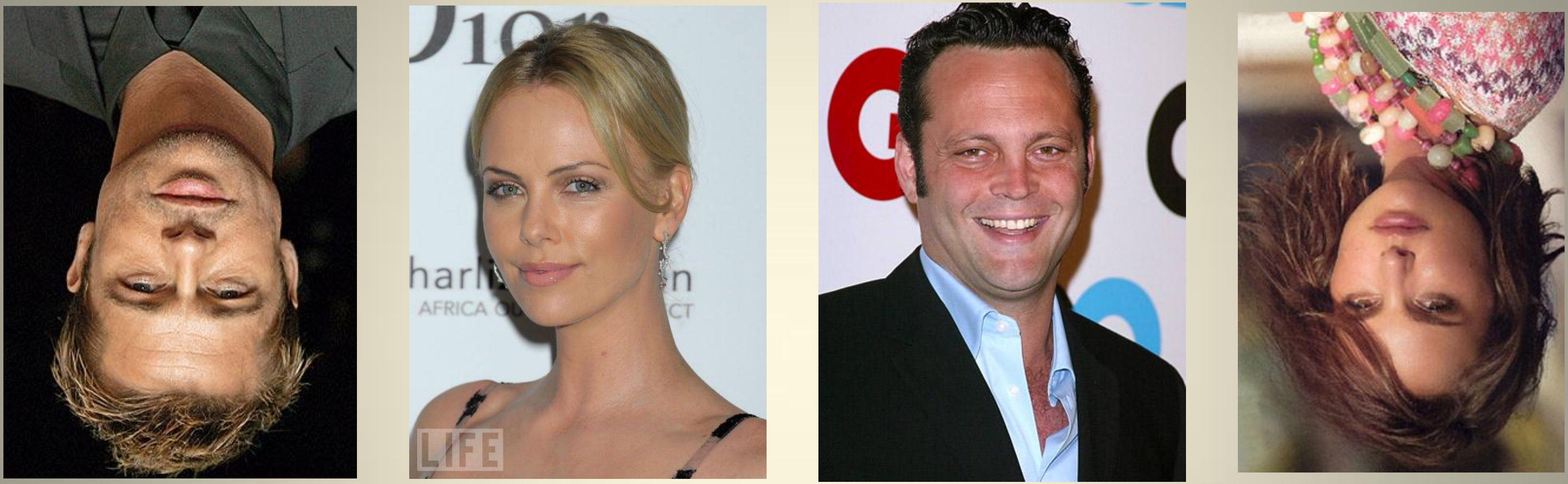


Figure 1. Performance on faces inspected and recognized upright and inverted, at ages 6 and 10.

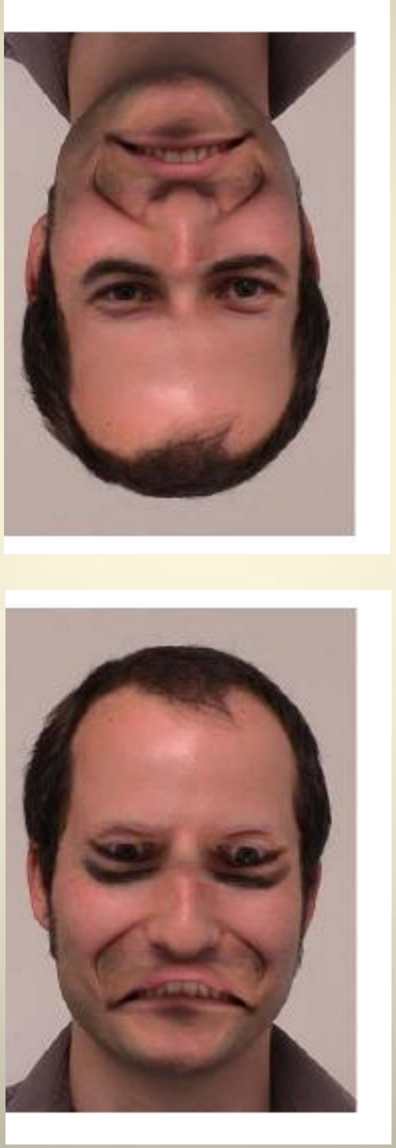


Carey, Diamond, & Woods (1980)

Memory for faces



Memory for faces



"Margaret Thatcher" effect
Thompson (1980)

Cross-race recognition

Table 1

Mean recognition memory performance for Caucasian and Asian subjects

	Caucasian Subjects	Asian Subjects
Hits		
Caucasian Faces	.79	.70
Asian Faces	.74	.73
False Alarms		
Caucasian Faces	.13	.20
Asian Faces	.23	.12
d'		
Caucasian Faces	2.19	1.56
Asian Faces	1.51	1.98

Hourihan, Benjamin, & Liu (2011)

Next class:
Distribution of learning